

59-62, as follows. Also enclosed, starting on a separate page following this response, is a marked copy of the presently amended claims showing all changes relative to the previous version.

(Claim numbering: Claims 55-58, filed by preliminary amendment February 7, 2000, should have been numbered 53-56, and the Examiner appears to have renumbered them as such in some parts of the Office Action. However, in view of the cancellation of claim 55 in the response filed 10/16/00, the applicants feel that renumbering the claims at this point would lead to confusion, so the original numbering of 55-58 is used in this response.)

17. (Three times amended) A catalytic organometallic composition, wherein the composition is the product of a process which comprises contacting, in a nonprotic, noncomplexing solvent,

(a) a chiral ligand L^1 comprising:

(i) a chiral component derived from a chiral diamine, diol, or amino alcohol, said component having first and second chiral centers, each substituted with a group X selected from -O- or -NR-, where R is hydrogen or lower alkyl,

wherein said chiral centers are connected by a direct bond or by a chain of one to three atoms comprising linkages selected from alkyl (carbon-carbon), alkyl ether (carbon-oxygen), alkyl amino (carbon-nitrogen), or a combination thereof,

and, linked to each said group X,

(ii) a heteroaryl binding group Cy_N having a ring nitrogen atom effective to bind to a metal atom selected from the group consisting of molybdenum, tungsten, and chromium,

wherein said binding group is linked to said group X at a ring carbon adjacent to said ring nitrogen atom, is optionally substituted with one or more groups selected from alkyl, alkenyl, aryl, aralkyl, alkoxy, aryloxy, acyl, acyloxy, amide, tertiary amine, nitro, or halogen, and may be fused to one or more additional rings,

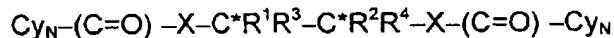
with

(b) a hexacoordinate complex of a metal selected from tungsten(0), chromium(0), and molybdenum(0),

whereby said complex undergoes a ligand exchange reaction, such that L^1 becomes coordinated to said metal;

wherein said composition is effective to catalyze the enantioselective alkylation of an allyl group bearing a leaving group at its allylic position.

17. (Amended) The composition of claim 17, wherein said ligand L^1 has the structure



wherein said chiral centers are connected by a direct bond, R^1 and R^2 are as defined above, R^3 and R^4 are hydrogen, and binding groups Cy_N are as defined above.

7 55 (Twice Amended) A catalytic organometallic composition, wherein the composition is the product of a process which comprises

contacting, in a nonprotic solvent, a chiral ligand L^1 comprising:

(a) an axially chiral 1,1'-binaphthyl system, said system substituted at its 2 position and at its 2' position with a group X selected from -O- or -NR-, where R is hydrogen or lower alkyl, and, linked to each said group X,

(ii) a heteroaryl binding group Cy_N having a ring nitrogen atom effective to bind to a metal atom selected from the group consisting of molybdenum, tungsten, and chromium,

wherein said binding group is linked to said group X at a ring carbon adjacent to said ring nitrogen atom, is optionally substituted with one or more groups selected from alkyl, alkenyl, aryl, aralkyl, alkoxy, aryloxy, acyl, acyloxy, amide, tertiary amine, nitro, or halogen, and may be fused to an one or more additional rings;

with a hexacoordinate complex of a metal selected from tungsten (0), chromium (0), and molybdenum(0),

whereby said complex undergoes a ligand exchange reaction, such that L^1 becomes coordinated to said metal;

wherein said composition is effective to catalyze the enantioselective alkylation of an allyl group bearing a leaving group at its allylic position

h1c126 9 55 (New) The composition of claim *17*, wherein said solvent is selected from the group consisting of ethers, hydrocarbon solvents, and mixtures thereof.

10 58 (New) The composition of claim *59*, wherein said solvent is selected from the group consisting of THF, toluene, and mixtures thereof.

11 59 (New) The composition of claim *57*, wherein said solvent is selected from the group consisting of ethers, hydrocarbon solvents, and mixtures thereof.

12 60 (New) The composition of claim *51*, wherein said solvent is selected from the group consisting of THF, toluene, and mixtures thereof.